

DIVING SYSTEM



ALLIANCE ENERGY SOLUTIONS

DIVING SYSTEM TECHNICAL SPECIFICATION (2 CONTAINERS CONCEPT)

IN COMPLIANCE: IMCA GUIDELINES

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Alliance Energy Solutions Pte Ltd

1.

INTRODUCTION

The Diving System which is designed and manufactured to meet IMCA guidelines. It is portable and designed for efficient and rapid mobilization.

The System is designed for Offshore, Construction and Inspection Maintenance and Repair work. The system is housed in two (2) 20ft containers and with two (2) independent LARS.

2.

CERTIFICATION

The pressure vessel is constructed and fabricated in accordance with ASME, PVHO-1-2012 code. Internal and external pressure hulls are abrasive blasted to SA 2.5 standards and painted for its intended use. Dedicated certified lifting slings are provided with the system.

3. DECK DECOMPRESSION CHAMBER/DIVE CONTROL CONTAINER



External



Internal

The Diving Decompression Chamber is housed in a 20 ft. DNV 2.7-1 compliant container. Components fitted internally and externally are as follows:

- Single layer steel plate for flooring and paint finished.
- Interior wall panel and ceiling are Rockwool insulated and covered in painted steel plate cladding.
- Anti-slip roofing
- 1 x Standard double leaf door with hinges and locking bar
- 2 x Personnel access door
- Chemical resist composite table top.
- 1 x Master communication master station. Able to accommodate 6 slaves station.
- 2 x Split air conditioning c/w blowers – 18000 BTU
- 2 x Emergency lights
- 1 x Electrical distribution box c/w MCB & ELCB – 220V
- 3 x 4ft twin fluorescent lightings – 36W
- 2 x Dry powder fire extinguisher
- 5 x 2-gang power sockets – 220V, 13A
- 2 x Recessed penetrator plates
- 1 x Wall mounted basic first aid kit box
- 2 x Umbilical horn (For Diver 1 & 2)
- 1 x Uninterrupted Power Supply (UPS)
- 3 x 200 m length Fibro flex diving umbilical consisting of, gas supply hose, Pneumo hose, Audio, Video and communication cable. The first 20 meters protected with spiral wrap.
- 7 x ½" Thermoplastic Hose (3500PSI – 15.24m)
- 1 x ¼" Thermoplastic Hose (Non-Conductive, 5000PSI for O2 use– 15.24m)
- 2 x Pressure reducing regulator (Gas supply to DDC)
- 1 x 4 legged lifting sling c/w shackles, master link and associated certification (DNV Type approved)

3.1 TWIN LOCK DIVING DECOMPRESSION CHAMBER (DDC)



The DDC with medical lock, and view ports, is outfitted to the following specification:

- DDC Floodable Volume Main Lock = 4.2 m³, Entry Lock = 1.8 m³ & Medical Lock = 0.0263 m³.
- The DDC is certified to ASME and PVHO code.
- Fully plumbed stainless steel and Tungum tubing with quarter turn and needle valves on either side of the hull penetrator. Non-return valves fitted to the inlet gas supplies.
- Deck covers are removable powdered coated, aluminum checkered plates.
- Chamber environment sampling lines
- Oxygen pipework installed with valves and quick connects for the BIBS
- Sound powered phones and bull horn speakers are also fitted to each lock

External

- 1 x Portable Oxygen Monitor c/w O₂ Sensor Cell (Ambient atmosphere)
- 1 x O₂ & CO₂ Analyzer on the control panel for (Chamber atmosphere)
- 1 x dedicated emergency Breathing Apparatus (BA) with communications for DDC operator.
- 1 x Solenoid c/w sensor
- 2 x Depth gauges on DDC control panel
- LP air and oxygen pressure indicating gauges
- Over pressure relief valve in Main lock
- 1 x Electrical distribution box

Internal

- 2 x Chamber lights
- 6 x Bibs
- 2 x Mattress c/w fire retardant mattress covers
- 1 x Hyperbaric fire extinguisher
- 1 x Caisson gauge in main lock
- 1 x receptor (Power provisions for optional scrubber installation), main lock

3.2 3 MEN AIR DIVE CONTROL PANEL

The 3 men Air Control Panel monitor the depth, and manages breathing gas supply to the divers via valves, pipework's, pressure indicating gauges and Depth gauges. It is integrated with, two, diver's communication radio, and an Audio / Video recording system capable of recording two divers simultaneously at work.

- Powder coated, wall mounted dive control panel with logic lines showing all functions for valves and gauges
- Pipe works plumbing with stainless steel or Tungum tubing.
- 1 x Emergency Breathing Apparatus (For Diving Supervisor)
- 1 lot various sizes Needle Valves
- 1 lot various sizes Ball Valves
- 3 x Flow Meter
- 3 x Pressure Limiting Valve
- 1 lot Relief Valve
- 1 lot Check Valve
- 3 x Pressure Reducing Regulator
- 3 x Depth Gauge
- 1 lot HP Indicating Gauge (0-5000PSI)
- 1 lot LP Indicating Gauge (0-600PSI)
- 1 lot 90 Micron 'T' Filter
- 3 x Oxygen Analyzers with Audio/Visual Alarm
- 2 x 3-Divers communication radios

3.3 UNDERWATER CCTV SYSTEM

The CCTV system consist of the following components:

- 2 x 19" LED Flat Screen Monitors for Divers 1 & 2 Underwater Surveillance Cameras
- 1 x 19" LED Flat Screen Monitors for Deck Surveillance Cameras
- 2 x 8 channel quad splitter
- 2 x Divers hat lights and camera control system
- 2 x DVD recording system

3.4 MISCELLANEOUS

- 2 x Kirby Morgan KM37 diving helmet
- 1 x Kirby Morgan KM18B diving band mask
- 3 x 80cuft SCUBA Tank
- 3 x 1st stage regulators c/w pressure gauges



4. MACHINERY/MAINTENANCE WORKSHOP CONTAINER

The 20ft Machinery Container, certified to DNV 2.7-1 consist of the following components:

- Steel plate for flooring and finished with marine paint
- Anti-Slip Roofing
- 1 x Standard double leaf door with hinges and locking bar
- 1 x main power distribution box
- 2 x personnel access door
- 1 X Window Unit Air Conditioning – 12000 BTU
- 4 x 4 ft. twin fluorescent lightings
- 2 x Emergency lights
- 2 x Dry powder fire extinguisher
- 1 x ELCCB panel
- 1 x MCB panel
- 2 x Transformers (15KVA, 440VAC to 220VAC)
- 2 x 327mm x 327mm x 82mm Industrial exhaust fan
- 1 x 4 legged lifting sling c/w shackles, master link and associated certification (DNV Type approved)



4.1 LOW PRESSURE COMPRESSOR – QUINCY 5120 (1 UNIT)

Technical details as follows:

- Electric Driven
- Volume tank capacity – 0.4542m³ (120 gallons)
- 440v, 50/60hz 3-phase Electric Motor
- Electrical Power Cable comes with plug
- Hankinson Water / Oil separator
- Hankinson Primary & Secondary Filter



4.2 HIGH PRESSURE COMPRESSOR – LW 320E MC (1 UNIT)

Technical details as follows:

- Electric Driven
- Medium: Breathing air
- Operating pressure 225 bar,
- Delivery rate- 320 liters/minute
- Electrical - 400V/440V, 60hz, 3-phase electric motor
- Electrical power cable with plug
- Water/oil separator/air filter





5. LAUNCH AND RECOVERY SYSTEM (LARS) – 2 UNITS

The LARS comprises of a steel base skid with flush mounted gratings. The A-frame operates hydraulically with sheaves mounted on the horizontal bar. The structure is also constructed with rectangular tubular sections with 4 lifting pad eyes. The clump weight designed at 250 kilograms is built based on approved engineering drawings. Each LARS will undergo 3rd party testing such as MPI and load test. Each LARS consists of the following components:

5.1 BASE SKID

- Flush mounted gratings
- 2 x 4 legged certified lifting sling c/w shackles, master link and associated certification

5.2 LARS (2 UNITS)

- 1 x SWL 1150 kg diving stages, completes with 2 x 50 litre x 200 bar cylinder. Each comes with 1st stage regulators and demand valves.
- 1 x 1.4Ton SWL Clump weight
- 2 x Hydraulic Winches (SWL 1.4 ton) c/w 14mmØ, non-rotating, galvanized wire rope – Main – 80 meters, Clump Weight – 160 meters.
- 2 x Hydraulic Rams
- 1 x Hydraulic Power Pack with 2 x motor and 2 x pump
- 1 x Emergency self-contained breathing apparatus (SCBA) fitted with communications (For operator)

***Note:**

Pictures are for illustration only. Design could change due to improvement and component availability.

6. TECHNICAL DOCUMENTATION

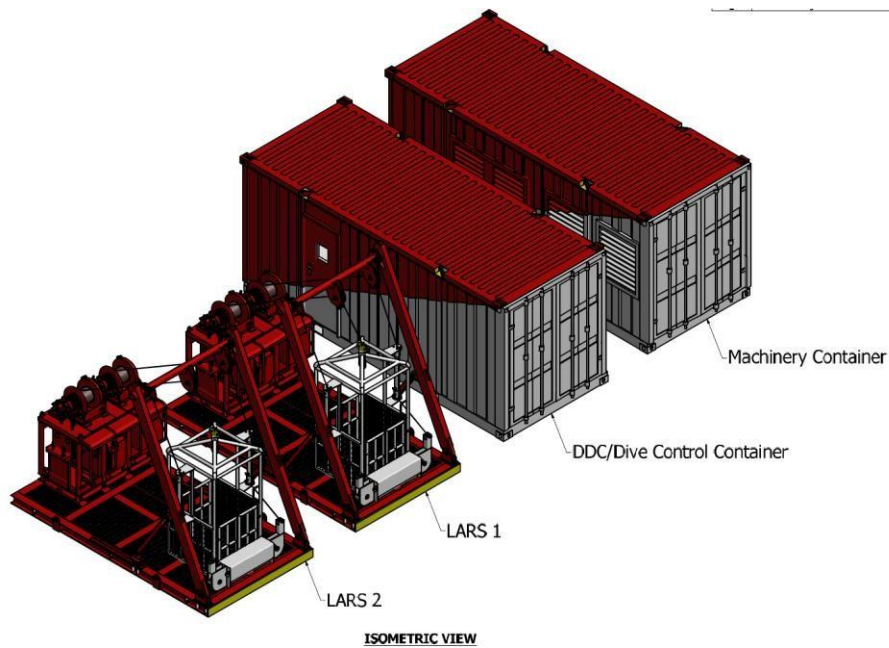
AES will supply Air Diving System with the following documents:

- 3rd Party IMCA D023 latest revision Audit Baseline Report
- System Original Certifications
- Equipment Operation and Maintenance Manuals

7. EQUIPMENT DIMENSION

Component	Approximate Weight (kg)	Dimension(mm) (L) x (W) x (H)
20FT DIVE CONTROL/DDC CONTAINER	10000	6058 x 2438 x 2896
20FT MACHINERY/MAINTENANCE WORKSHOP CONTAINER	12000	6058 x 2438 x 2896
LARS	6500	4572 x 2438 x 2700
LARS	6500	4572 x 2438 x 2700
GROSS ESTIMATED TOTAL	35000	-

8. EQUIPMENT LAYOUT



Total Area – 51.832 sq m